APPENDIX G

GENERATING STATION STATIONERY SOURCE AMBIENT AIR QUALITY IMPACT ANALYSIS

Commissioning Operations:

- **Emission Parameters**
- **Significant Change In Air Quality**
- **Ambient NO_2 Analysis**
- **Ambient CO Analysis**
- **Ambient PM_{10} Analysis**
- **Ambient $PM_{2.5}$ Analysis**
- **Ambient SO_2/Sulfate Analysis**
- **Summary of Air Quality Analysis**

Normal Operations:

- **Emission Parameters**
- **Significant Change In Air Quality**
- **Ambient NO_2 Analysis**
- **Ambient CO Analysis**
- **Ambient PM_{10} Analysis**
- **Ambient $PM_{2.5}$ Analysis**
- **Ambient SO_2/Sulfate Analysis**
- **Summary of Air Quality Analysis**

Fumigation Conditions:

- **Emission Parameters**
- **Ambient NO_2 Analysis**
- **Ambient PM_{10} Analysis**
- **Ambient SO_2/Sulfate Analysis**
- **Summary of Air Quality Analysis**

Revised Air Quality Impact Analysis - Summary of Ambient Air Quality Analysis
GE Gas Turbines - Commission Operations
Riverside ERC
Revision Date: 5/28/04

Ambient Air Quality Analysis:

Pollutant	Averaging Time	Project Impacts	Ambient Background	Year of Maximum Background	Total Impacts (Project + Ambient)	Ambient Standard
NO_x	1 - Hour (ppm)	0.035	0.15	2001, Rubidoux	0.185	0.25
NO_x	Annual (ppm)	0.00004	0.03	1999, Rubidoux	0.026	0.0534
CO	1 - Hour (ppm)	0.059	11.0	1997, Riverside Magnolia	11.1	20.0
CO	8 - Hour (ppm)	0.041	5.8	1997, Rubidoux	5.8	9.0
PM	24 - Hour ($\mu g/m^3$)	1.797	164.0	2003, Rubidoux	165.8	50.0
PM_{10}	Annual ($\mu g/m^3$)	0.187	72.30	1999, Rubidoux	72.5	20.0
$PM_{2.5}$	24 - Hour ($\mu g/m^3$)	1.797	119.6	2000, Rubidoux	121.4	65.0
$PM_{2.5}$	Annual ($\mu g/m^3$)	0.187	31.10	2001, Rubidoux	31.3	12.0
Sulfate	24 - Hour ($\mu g/m^3$)	0.959	11.700	2002, Rubidoux	12.66	25.00
SO_2	1-hour (ppm)	0.00091	0.110	2000, Rubidoux	0.11	0.25
SO_2	24-hour (ppm)	0.0004	0.041	2000, Rubidoux	0.041	0.040

Revised Air Quality Impact Analysis - Significant Change In Air Quality
GE Gas Turbines - Commission Operations
Riverside ERC
Revision Date: 5/28/04

Modeling Results:

1st Max =	5.82660	(ug/m$^{3)}$/(g/sec)	1 - Hour Average Concentration	(@ 1.0 g/s per turbine)
1st Max =	5.74174	(ug/m$^{3)}$/(g/sec)	3 - Hour Average Concentration	(@ 1.0 g/s per turbine)
1st Max =	4.05330	(ug/m$^{3)}$/(g/sec)	8 - Hour Average Concentration	(@ 1.0 g/s per turbine)
1st Max =	2.34810	(ug/m$^{3)}$/(g/sec)	24 - Hour Average Concentration	(@ 1.0 g/s per turbine)
1st Max =	0.24320	(ug/m$^{3)}$/(g/sec)	Annual Average Concentration	(@ 1.0 g/s per turbine)

** Annual average concentration values for PM emissions are based on actual emission rates and not 1.0 g/s.

Air Quality Impacy Analysis:

Pollutant	Averaging Time	Emission Rate (g/sec)	Maximum Impact (ug/m^3)	SCAQMD Significant Change In Air Quality Threshold (ug/m^3)
NO_2	1 - Hour	11.32	**65.97**	**20.0**
NO_2	Annual	0.51	**0.12**	**1.0**
CO	1 - Hour	11.57	**67.43**	**1100.0**
CO	8 - Hour	11.57	**46.91**	**500.0**
PM	24 - Hour	0.76	**1.7970**	**2.5**
PM_{10}	Annual	0.11	**0.1871**	**1.0**
$PM_{2.5}$	24 - Hour	0.76	**1.7970**	**N/A**
$PM_{2.5}$	Annual	0.11	**0.1871**	**N/A**
Sulfate	24-Hour	0.41	**0.96**	**N/A**
SO2	1 - Hour	0.41	**2.38**	**N/A**
SO2	24-Hour	0.41	**0.96**	**N/A**

Note:
- X/Q Max values (ug/m^3/g/sec) are taken from the ISC 3 model.
- Impacts analysis utilized the standard stack release parameters.
- PM rates differ by source and model input/output are not normalized for PM emissions.

Revised Air Quality Impact Analysis - Ambient NO_2 Analysis
GE Gas Turbines - Commission Operations
Riverside ERC
Revision Date: 5/28/04

1-Hour NO_2 Analysis:

1. Convert NO2 1-hour project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm NO2 = ($\mu g/m^3$) (0.0245/NO2 MW)

Where:

NO2 1-Hour $\mu g/m^3$:	66.0	OLM Ratio	1.00
NO2 MW:	46.0	(Valid only for consruction impacts)	
Conversion:	0.0245		

So:

ppm NO2= 0.0351

2. Add NO2 1-hour background ambient data to projects modeling impacts.

ppm NO2 = (projects modeling impacts + background ambient data)

Where:

Projects modeling impacts (ppm): 0.035
Ambient background data (ppm): 0.15 Station 4144 - Rubidoux - Year 2001

So:

Project + Background (ppm): 0.19
Most Stringent NO2 1-Hour Standard (ppm): 0.25

Annual NO_2 Analysis:

1. Convert annual project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm NO2 = ($\mu g/m^3$) (0.0245/NO2 MW)

Where:

NO2 1-Annual $\mu g/m^3$:	0.12	OLM Ratio	0.59
NO2 MW:	46.0		
Conversion:	0.0245		

So:

ppm NO2 = 0.00004

2. Add NO2 annual background ambient data to projects modeling impacts.

ppm NO2 = (projects modeling impacts + background ambient data)

Where:

Projects modeling impacts (ppm): 0.00004
Ambient background data (ppm): 0.0262 Station 4144 - Rubidoux - Year 1999

So:

Project + Background (ppm): 0.0262
Most Stringent NO2 Annual Standard (ppm): 0.0534

Revised Air Quality Impact Analysis - Ambient CO Analysis
GE Gas Turbines - Commission Operations
Riverside ERC
Revision Date: 5/28/04

1-Hour CO Analysis:

1. Convert CO 1-hour project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm CO = ($\mu g/m^3$) (0.0245/CO MW)

Where:

CO 1-Hour $\mu g/m^3$:	67.4
CO MW:	28.0
Conversion:	0.0245

So:

ppm CO =	0.0590

2. Add CO 1-hour background ambient data to projects modeling impacts.

ppm CO = (projects modeling impacts + background ambient data)

Where:

Projects modeling impacts (ppm):	0.059	
Ambient background data (ppm):	11.0	Station 4146 - Riverside- Magnolia - 1997

So:

Project + Background (ppm):	11.06
Most Stringent CO 1-Hour Standard (ppm):	20.0

8-Hour CO Analysis:

1. Convert annual project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm CO = ($\mu g/m^3$) (0.0245/CO MW)

Where:

CO 8-Hour $\mu g/m^3$:	46.9
CO MW:	28.0
Conversion:	0.0245

So:

ppm CO=	0.041

2. Add CO 8-Hour background ambient data to projects modeling impacts.

ppm CO = (projects modeling impacts + background ambient data)

Where:

Projects modeling impacts (ppm):	0.041	
Ambient background data (ppm):	5.8	Station 4144 - Rubidoux - 1997

So:

Project + Background (ppm):	5.84
Most Stringent CO 8-Hour Standard (ppm):	9.0

Revised Air Quality Impact Analysis - Ambient PM_{10} Analysis
GE Gas Turbines - Commission Operations
Riverside ERC
Revision Date: 5/28/04

24-Hour PM_{10} Analysis:

1. Add PM_{10} 24-Hour background ambient data to projects modeling impacts.

Where:

Projects modeling impacts ($\mu g/m^3$): 1.797
Ambient background data ($\mu g/m^3$): 164.0 Station 4144 - Rubidoux - 2003

So:

Project + Background ($\mu g/m^3$): 165.8
Most Stringent PM_{10} 24-Hour Standard ($\mu g/m^3$): 50.0

Annual PM_{10} Analysis:

1. Add PM_{10} Annual background ambient data to projects modeling impacts.

Where:

Projects modeling impacts ($\mu g/m^3$): 0.187
Ambient background data ($\mu g/m^3$): 72.3 Station 4144 - Rubidoux - 1999

So:

Project + Background ($\mu g/m^3$): 72.49
Most Stringent PM_{10} Annual Standard ($\mu g/m^3$): 30.0

Revised Air Quality Impact Analysis - Ambient $PM_{2.5}$ Analysis
GE Gas Turbines - Commission Operations
Riverside ERC
Revision Date: 5/28/04

24-Hour $PM_{2.5}$ Analysis:

1. Add $PM_{2.5}$ 24-Hour background ambient data to projects modeling impacts.

Where:

Projects modeling impacts ($\mu g/m^3$): 1.7970
Ambient background data ($\mu g/m^3$): 119.6 Station 4144 - Rubidoux - Year 2000

So:

Project + Background ($\mu g/m^3$): 121.4
Most Stringent $PM_{2.5}$ 24-Hour Standard ($\mu g/m^3$): 50.0

Annual $PM_{2.5}$ Analysis:

1. Add $PM_{2.5}$ Annual background ambient data to projects modeling impacts.

Where:

Projects modeling impacts ($\mu g/m^3$): 0.1871
Ambient background data ($\mu g/m^3$): 31.1 Station 4144 - Rubidoux - Year 2001

So:

Project + Background ($\mu g/m^3$): 31.29
Most Stringent $PM_{2.5}$ Annual Standard ($\mu g/m^3$): 30.0

Revised Air Quality Impact Analysis - Emission Parameters
GE Gas Turbines - Commission Operations
Riverside ERC
Revision Date: 5/28/04

Equipment Information:

Equipment Type: Gas Turbines	Capacity: -	Fuel: Natural Gas
Manufacturer: GE	Output (MW): 100	HHV: 1050
Model: LM6000	# of Units: 2	

Emission Rates:

Pollutant	Per Unit Emission Rate (lbs/hr)	Total Emission Rate (lbs/hr)	Total Emission Rate (g/s)		Comments
NO_x	44.93	89.86	11.32	1-Hour	Uncontrolled 100% Load
NO_x	2.019	4.04	0.51	Annual	annual emissions averaged over 8760 hours*
CO	45.93	91.86	11.57	1-Hour	Uncontrolled 100% Load
CO	45.93	91.86	11.57	8-Hour	Uncontrolled 100% Load
PM_{10}	3.00	6.00	0.76	24-Hour	normal hour operation
PM_{10}	0.450	0.90	0.11	Annual	annual emissions averaged over 8760 hours**
$PM_{2.5}$	3.00	6.00	0.76	24-Hour	normal hour operation
$PM_{2.5}$	0.450	0.90	0.11	Annual	annual emissions averaged over 8760 hours**
SO_x	1.62	3.24	0.41	1 hour / 3-Hour	normal hour operation
SO_x	1.62	3.24	0.41	24-Hour	normal hour operation

Emission rates on this page exclude the cooling tower because PM pates are not normalized.
Cooling tower emissions are included in the PM worksheets.

* Annual average 1 hr NOx = ((44.93 lb/hr x 200 commission hrs) + (4.49 lb/hr x 710 normal hrs) + (16.47lb/hr x 200 startup hours) + (6.6lb/hr x 200 shutdown hours)+(44.93lb/hr x 20 maintenance hours)) / 8760 hours/yr

** Annual average 1 hr PM10 = ((3.0lb/hr x 200 commissioning hours)+(3.0 lb/hr x 710 normal hours) + (2.74lb/hr x 200 startup hours) + (3.0lb/hr x 200 shutdown hours) +(3.0lb/hr x 20 maintenance hours)) / 8760 hours/year
PM10 assumed to be 100% PM2.5

*** 1-Hour, 3-Hour, 8-Hour and 24-Hour emission impacts also represent maintenance operations.

Cooling Tower Emissions Summary
One Unit - Commission Operations
Riverside ERC

Equipment Information:

Equipment Type:	Cooling Tower	Capacity (tons):	3,140	Water Flow Per Cell (gpm):	1,863
Manufacturer:	Evapco	Air Flow Per Cell (acfm)	204,333	Drift Rate (%):	0.001
Model:	314-0772	# of Cells:	3	TDS Level (ppm):	2644
		Annual Operating Schedule:	1330		

Emission Rates:

Pollutant	Per Cell Emission Rate (lbs/hr)	Total Emission Rate (lbs/hr)	Total Emission Rate (g/s)		Comments
PM_{10}	0.02	0.07	0.009	24-Hour	
PM_{10}	0.004	0.011	0.0014	Annual	annual emissions averaged over 1330 hours
$PM_{2.5}$	0.02	0.07	0.01	24-Hour	
$PM_{2.5}$	0.004	0.011	0.0014	Annual	annual emissions averaged over 1330 hours

Notes:
1. Total cooling tower flow rate: (613,000 acfm).
2. Total cooling tower circulation rate: 5590 (gpm).

Revised Air Quality Impact Analysis - Summary of Ambient Air Quality Analysis
GE Gas Turbines - Normal Operations
Riverside ERC
Revision Date: 5/28/04

Ambient Air Quality Analysis:

Pollutant	Averaging Time	Project Impacts	Ambient Background	Year of Maximum Background	Total Impacts (Project + Ambient)	Ambient Standard
NO_x	1 - Hour (ppm)	0.0129	0.1500	2001, Rubidoux	0.16	0.25
NO_x	Annual (ppm)	0.0000	0.0262	1999, Rubidoux	0.03	0.05
CO	1 - Hour (ppm)	0.0170	11.0000	1997, Riverside Magnolia	11.02	20.00
CO	8 - Hour (ppm)	0.0109	5.8000	1997, Rubidoux	5.81	9.00
PM	24 - Hour ($\mu g/m^3$)	1.7970	164.0000	2003, Rubidoux	165.80	50.00
PM_{10}	Annual ($\mu g/m^3$)	0.1871	72.3000	1999, Rubidoux	72.49	20.00
$PM_{2.5}$	24 - Hour ($\mu g/m^3$)	1.7970	119.6000	2000, Rubidoux	121.40	65.00
$PM_{2.5}$	Annual ($\mu g/m^3$)	0.1871	31.1000	2001, Rubidoux	31.29	12.00
Sulfate	24 - Hour ($\mu g/m^3$)	0.9585	11.7000	2002, Rubidoux	12.66	25.00
SO_2	1-hour (ppm)	0.0009	0.1100	2000, Rubidoux	0.11	0.25
SO_2	24-hour (ppm)	0.0004	0.0410	2000, Rubidoux	0.04	0.04

Revised Air Quality Impact Analysis - Significant Change In Air Quality
GE Gas Turbines - Normal Operations
Riverside ERC
Revision Date: 5/28/04

Modeling Results:

1st Max =	5.82660	(ug/m$^{3)}$/(g/sec)	1 - Hour Average Concentration	(@ 1.0 g/s per turbine)
1st Max =	5.74174	(ug/m$^{3)}$/(g/sec)	3 - Hour Average Concentration	(@ 1.0 g/s per turbine)
1st Max =	4.05330	(ug/m$^{3)}$/(g/sec)	8 - Hour Average Concentration	(@ 1.0 g/s per turbine)
1st Max =	2.34810	(ug/m$^{3)}$/(g/sec)	24 - Hour Average Concentration	(@ 1.0 g/s per turbine)
1st Max =	0.24320	(ug/m$^{3)}$/(g/sec)	Annual Average Concentration	(@ 1.0 g/s per turbine)

Air Quality Impacy Analysis:

Pollutant	Averaging Time	Emission Rate (g/sec)	Maximum Impact (ug/m^3)	SCAQMD Significant Change In Air Quality Threshold (ug/m^3)
NO_2	1 - Hour	4.15	**24.1808**	**20.0**
NO_2	Annual	0.28	**0.0671**	**1.0**
CO	1 - Hour	3.33	**19.3799**	**1100.0**
CO	8 - Hour	3.07	**12.4502**	**500.0**
PM	24 - Hour	0.11	**1.7970**	**2.5**
PM_{10}	Annual	0.11	**0.1871**	**1.0**
$PM_{2.5}$	24 - Hour	0.76	**1.7970**	**N/A**
$PM_{2.5}$	Annual	0.11	**0.1871**	**N/A**
Sulfate	24-Hour	0.41	**0.9585**	**N/A**
SO2	1 - Hour	0.41	**2.3784**	**N/A**
SO2	24-Hour	0.41	**0.9585**	**N/A**

:ce . Model input/output are not normalized

Note:

- X/Q Max values (ug/m^3/g/sec) are taken from the ISC 3 model.
- Impacts analysis utilized the standard stack release parameters.

Revised Air Quality Impact Analysis - Ambient NO_2 Analysis
GE Gas Turbines - Normal Operations
Riverside ERC
Revision Date: 5/28/04

1-Hour NO_2 Analysis:

1. Convert NO2 1-hour project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm NO2 = ($\mu g/m^3$) (0.0245/NO2 MW)

Where:

NO2 1-Hour $\mu g/m^3$:	24.2	OLM Ratio	1.00
NO2 MW:	46.0	(Valid only for consruction impacts)	
Conversion:	0.0245		

So:

ppm NO2= 0.0129

2. Add NO2 1-hour background ambient data to projects modeling impacts.

ppm NO2 = (projects modeling impacts + background ambient data)

Where:

Projects modeling impacts (ppm): 0.013
Ambient background data (ppm): 0.15 Station 4144 - Rubidoux - Year 2001

So:

Project + Background (ppm): 0.16
Most Stringent NO2 1-Hour Standard (ppm): 0.25

Annual NO_2 Analysis:

1. Convert annual project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm NO2 = ($\mu g/m^3$) (0.0245/NO2 MW)

Where:

NO2 1-Annual $\mu g/m^3$:	0.07	OLM Ratio	0.59
NO2 MW:	46.0		
Conversion:	0.0245		

So:

ppm NO2 = 0.00002

2. Add NO2 annual background ambient data to projects modeling impacts.

ppm NO2 = (projects modeling impacts + background ambient data)

Where:

Projects modeling impacts (ppm): 0.00002
Ambient background data (ppm): 0.0262 Station 4144 - Rubidoux - Year 1999

So:

Project + Background (ppm): 0.0262
Most Stringent NO2 Annual Standard (ppm): 0.0534

Revised Air Quality Impact Analysis - Ambient CO Analysis
GE Gas Turbines - Normal Operations
Riverside ERC
Revision Date: 5/28/04

1-Hour CO Analysis:

1. Convert CO 1-hour project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm CO = ($\mu g/m^3$) (0.0245/CO MW)

Where:

CO 1-Hour $\mu g/m^3$:	19.4
CO MW:	28.0
Conversion:	0.0245

So:

ppm CO =	0.0170

2. Add CO 1-hour background ambient data to projects modeling impacts.

ppm CO = (projects modeling impacts + background ambient data)

Where:

Projects modeling impacts (ppm):	0.017	
Ambient background data (ppm):	11.0	Station 4146 - Riverside- Magnolia - 1997

So:

Project + Background (ppm):	11.02
Most Stringent CO 1-Hour Standard (ppm):	20.0

8-Hour CO Analysis:

1. Convert annual project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm CO = ($\mu g/m^3$) (0.0245/CO MW)

Where:

CO 8-Hour $\mu g/m^3$:	12.5
CO MW:	28.0
Conversion:	0.0245

So:

ppm CO=	0.011

2. Add CO 8-Hour background ambient data to projects modeling impacts.

ppm CO = (projects modeling impacts + background ambient data)

Where:

Projects modeling impacts (ppm):	0.011	
Ambient background data (ppm):	5.8	Station 4144 - Rubidoux - 1997

So:

Project + Background (ppm):	5.81
Most Stringent CO 8-Hour Standard (ppm):	9.0

Revised Air Quality Impact Analysis - Ambient PM_{10} Analysis
GE Gas Turbines - Normal Operations
Riverside ERC
Revision Date: 5/28/04

24-Hour PM_{10} Analysis:

1. Add PM_{10} 24-Hour background ambient data to projects modeling impacts.

Where:

Projects modeling impacts ($\mu g/m^3$): 1.797

Ambient background data ($\mu g/m^3$): 164.0 Station 4144 - Rubidoux - 2003

So:

Project + Background ($\mu g/m^3$): 165.8

Most Stringent PM_{10} 24-Hour Standard ($\mu g/m^3$): 50.0

Annual PM_{10} Analysis:

1. Add PM_{10} Annual background ambient data to projects modeling impacts.

Where:

Projects modeling impacts ($\mu g/m^3$): 0.187

Ambient background data ($\mu g/m^3$): 72.3 Station 4144 - Rubidoux - 1999

So:

Project + Background ($\mu g/m^3$): 72.49

Most Stringent PM_{10} Annual Standard ($\mu g/m^3$): 30.0

Revised Air Quality Impact Analysis - Ambient $PM_{2.5}$ Analysis
GE Gas Turbines - Normal Operations
Riverside ERC
Revision Date: 5/28/04

24-Hour $PM_{2.5}$ Analysis:

1. Add $PM_{2.5}$ 24-Hour background ambient data to projects modeling impacts.

Where:

Projects modeling impacts ($\mu g/m^3$): 1.80
Ambient background data ($\mu g/m^3$): 119.6 Station 4144 - Rubidoux - Year 2000

So:

Project + Background ($\mu g/m^3$): 121.4
Most Stringent $PM_{2.5}$ 24-Hour Standard ($\mu g/m^3$): 50.0

Annual $PM_{2.5}$ Analysis:

1. Add $PM_{2.5}$ Annual background ambient data to projects modeling impacts.

Where:

Projects modeling impacts ($\mu g/m^3$): 0.19
Ambient background data ($\mu g/m^3$): 31.1 Station 4144 - Rubidoux - Year 2001

So:

Project + Background ($\mu g/m^3$): 31.29
Most Stringent $PM_{2.5}$ Annual Standard ($\mu g/m^3$): 30.0

Revised Air Quality Impact Analysis - Ambient SO_2 / Sulfate
GE Gas Turbines - Normal Operations
Riverside ERC
Revision Date: 5/28/04

24-Hour Particulate Sulfate Analysis:

1. Add SOx 24-Hour background ambient data to projects modeling impacts.

Where:

Projects modeling impacts ($\mu g/m^3$):	0.96	
Ambient background data ($\mu g/m^3$):	11.7	Station 4144 - Rubidoux - Year 2002

So:

Project + Background ($\mu g/m^3$):	12.66
Most Stringent SO_2 24-Hour Standard ($\mu g/m^3$):	25.0

1-Hour SO_2 Analysis:

1. Convert SO2 1-hour project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm SO2 = ($\mu g/m^3$) (0.0245/SO2 MW)

Where:

SO2 1-Hour $\mu g/m^3$:	2.378
SO2 MW:	64.0
Conversion:	0.0245

So:

ppm SO2=	0.000910

2. Add SOx 1-Hour background ambient data to projects modeling impacts.

Where:

Projects modeling impacts (ppm):	0.000910	
Ambient background data (ppm):	0.11	Station 4144 - Rubidoux - Year 2000

So:

Project + Background (ppm):	0.11
Most Stringent SO_2 24-Hour Standard (ppm):	0.25

24-Hour SO_2 Analysis:

1. Convert SO2 24-hour project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm SO2 = ($\mu g/m^3$) (0.0245/SO2 MW)

Where:

SO2 24-Hour $\mu g/m^3$:	0.959
SO2 MW:	64.0
Conversion:	0.0245

So:

ppm SO2=	0.000367

1. Add SOx 24-Hour background ambient data to projects modeling impacts.

Where:

Projects modeling impacts (ppm):	0.00037	
Ambient background data (ppm):	0.041	Station 4144 - Rubidoux - Year 2000

So:

Project + Background (ppm):	0.041
Most Stringent SO_2 24-Hour Standard (ppm):	0.040

Revised Air Quality Impact Analysis - Emission Parameters
GE Gas Turbines - Normal Operations
Riverside ERC
Revision Date: 5/28/04

Equipment Information:

Equipment Type: Gas Turbines	Capacity: -	Fuel: Natural Gas
Manufacturer: GE	Output (MW): 100	HHV: 1050
Model: LM6000	# of Units: 2	

Emission Rates:

Pollutant	Per Unit Emission Rate (lbs/hr)	Total Emission Rate (lbs/hr)	Total Emission Rate (g/s)		Comments
NO_x	16.47	32.94	4.15	1-Hour	startup hour operation
NO_x	1.096	2.19	0.28	Annual	annual emissions averaged over 8760 hours*
CO	13.20	26.40	3.33	1-Hour	startup hour operation
CO	12.19	24.38	3.07	8-Hour	average of 4 start and 4 shutdown hours**
PM_{10}	3.00	6.00	0.76	24-Hour	normal hour operation
PM_{10}	0.450	0.90	0.11	Annual	annual emissions averaged over 8760 hours***
$PM_{2.5}$	3.00	6.00	0.76	24-Hour	normal hour operation
$PM_{2.5}$	0.450	0.90	0.11	Annual	annual emissions averaged over 8760 hours***
SO_x	1.62	3.24	0.41	1 hour / 3-Hour	normal hour operation
SO_x	1.62	3.24	0.41	24-Hour	normal hour operation

Emission rates on this page exclude the cooling tower because PM rates are not normalized.
Cooling tower emissions are included in the PM worksheets.

* Annual average 1 hr NOx = ((4.49lb/hr x 910 normal hours) + (16.47lb/hr x 200 startup hours) + (6.6lb/hr x 200 shutdown hours) + (44.93lb/hr x 20 maintenance hours)) / 8760hrs/yr

** 1-hr CO averaged over 8 hrs = ((13.2lb/hr x 4 startup hours) + (11.18lb/hr x 4 shutdown hours)) / 8 hours

*** Annual average 1 hr PM10 = ((3.0lb/hr x 910 normal hours)+(2.74lb/hr x 200 startup hours) + (3.0lb/hr x 200 shutdown hours)+(3.0lb/hr x 20 maintenance hours)) / 8760 hrs/yr

PM10 assumed to be 100% PM2.5

Cooling Tower Emissions Summary
One Unit - Normal Operations
Riverside ERC

Equipment Information:

Equipment Type: Cooling Tower	Capacity (tons): 3,140	Water Flow Per Cell (gpm): 1,863
Manufacturer: Evapco	Air Flow Per Cell (acfm) 204,333	Drift Rate (%): 0.001
Model: 314-0772	# of Cells: 3	TDS Level (ppm): 2644
	Annual Operating Schedule: 1330	

Emission Rates:

Pollutant	Per Cell Emission Rate (lbs/hr)	Total Emission Rate (lbs/hr)	Total Emission Rate (g/s)		Comments
PM_{10}	0.02	0.07	0.009	24-Hour	
PM_{10}	0.004	0.011	0.0014	Annual	annual emissions averaged over 1330 hours
$PM_{2.5}$	0.02	0.07	0.01	24-Hour	
$PM_{2.5}$	0.004	0.011	0.0014	Annual	annual emissions averaged over 1330 hours

Notes:
1. Total cooling tower flow rate: (613,000 acfm).
2. Total cooling tower circulation rate: 5590 (gpm).
3. Actual cooling tower emission rates were used in the air dispersion model.

Air Quality Impact Analysis - Summary of Ambient Air Quality Analysis
GE Gas Turbines - Fumigation Conditions
Riverside ERC

Ambient Air Quality Analysis:

Pollutant	Averaging Time	Project Impacts	Ambient Background	Year of Maximum Background	Total Impacts (Project + Ambient)	Ambient Standard
NO_x	1 - Hour (ppm)	0.006	0.15	2001	0.156	0.25
NO_x	Annual (ppm)	N/A	N/A	N/A	N/A	N/A
CO	1 - Hour (ppm)	0.011	11.0	1997	11.0	20.0
CO	8 - Hour (ppm)	N/A	N/A	N/A	N/A	N/A
PM	24 - Hour ($\mu g/m^3$)	N/A	N/A	N/A	N/A	N/A
PM_{10}	Annual ($\mu g/m^3$)	N/A	N/A	N/A	N/A	N/A
$PM_{2.5}$	24 - Hour ($\mu g/m^3$)	N/A	N/A	N/A	N/A	N/A
$PM_{2.5}$	Annual ($\mu g/m^3$)	N/A	N/A	N/A	N/A	N/A
Sulfate	24 - Hour ($\mu g/m^3$)	N/A	N/A	N/A	N/A	N/A
SO_2	1-hour (ppm)	0.0002	0.11	2000	0.110	0.25
SO_2	24-hour (ppm)	N/A	N/A	N/A	N/A	N/A

Air Quality Impact Analysis - Significant Change In Air Quality
GE Gas Turbines - Fumigation Conditions
Riverside ERC

Modeling Results:

1st Max =	1.05400	(ug/m$^{3)}$/(g/sec)	1 - Hour Average Concentration	(@ 1.0 g/s per turbine)
1st Max =	na	(ug/m$^{3)}$/(g/sec)	3 - Hour Average Concentration	(@ 1.0 g/s per turbine)
1st Max =	na	(ug/m$^{3)}$/(g/sec)	8 - Hour Average Concentration	(@ 1.0 g/s per turbine)
1st Max =	na	(ug/m$^{3)}$/(g/sec)	24 - Hour Average Concentration	(@ 1.0 g/s per turbine)
1st Max =	na	(ug/m$^{3)}$/(g/sec)	Annual Average Concentration	(@ 1.0 g/s per turbine)

Air Quality Impacy Analysis:

Pollutant	Averaging Time	Emission Rate (g/sec)	Maximum Impact (ug/m^3)	SCAQMD Significant Change In Air Quality Threshold (ug/m^3)
NO_2	1 - Hour	11.32	**11.93**	**20.0**
NO_2	Annual	-	**N/A**	**1.0**
CO	1 - Hour	11.57	**12.20**	**1100.0**
CO	8 - Hour	-	**N/A**	**500.0**
PM	24 - Hour	-	**N/A**	**2.5**
PM_{10}	Annual	-	**N/A**	**1.0**
$PM_{2.5}$	24 - Hour	-	**N/A**	**N/A**
$PM_{2.5}$	Annual	-	**N/A**	**N/A**
Sulfate	24-Hour	-	**N/A**	**N/A**
SO2	1 - Hour	0.41	**0.43**	**N/A**
SO2	24-Hour	-	**N/A**	**N/A**

Note:
- X/Q Max values (ug/m^3/g/sec) are taken from the SCREEN3 model.
- Impacts analysis utilized the standard stack release parameters.

Air Quality Impact Analysis - Ambient NO_2 Analysis
GE Gas Turbines - Fumigation Conditions
Riverside ERC

1-Hour NO_2 Analysis:

1. Convert NO2 1-hour project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm NO2 = ($\mu g/m^3$) (0.0245/NO2 MW)

Where:

NO2 1-Hour $\mu g/m^3$:	11.9	OLM Ratio	1.00
NO2 MW:	46.0	(Valid only for consruction impacts)	
Conversion:	0.0245		

So:

ppm NO2= 0.0064

2. Add NO2 1-hour background ambient data to projects modeling impacts.

ppm NO2 = (projects modeling impacts + background ambient data)

Where:

Projects modeling impacts (ppm): 0.006

Ambient background data (ppm): 0.15 Station 4144 - Rubidoux - Year 2001

So:

Project + Background (ppm): 0.16

Most Stringent NO2 1-Hour Standard (ppm): 0.25

Annual NO_2 Analysis:

1. Convert annual project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm NO2 = ($\mu g/m^3$) (0.0245/NO2 MW)

Where:

NO2 1-Annual $\mu g/m^3$:	N/A	OLM Ratio	0.59
NO2 MW:	46.0		
Conversion:	0.0245		

So:

ppm NO2 = N/A

2. Add NO2 annual background ambient data to projects modeling impacts.

ppm NO2 = (projects modeling impacts + background ambient data)

Where:

Projects modeling impacts (ppm): N/A

Ambient background data (ppm): 0.0262 Station 4144 - Rubidoux - Year 1999

So:

Project + Background (ppm): N/A

Most Stringent NO2 Annual Standard (ppm): 0.0534

Air Quality Impact Analysis - Ambient CO Analysis
GE Gas Turbines - Fumigation Conditions
Riverside ERC

1-Hour CO Analysis:

1. Convert CO 1-hour project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm CO = ($\mu g/m^3$) (0.0245/CO MW)

Where:

CO 1-Hour $\mu g/m^3$:	12.2
CO MW:	28.0
Conversion:	0.0245

So:

ppm CO =	0.0107

2. Add CO 1-hour background ambient data to projects modeling impacts.

ppm CO = (projects modeling impacts + background ambient data)

Where:

Projects modeling impacts (ppm):	0.011	
Ambient background data (ppm):	11.0	Station 4146 - Riverside Magnolia - 1997

So:

Project + Background (ppm):	11.01
Most Stringent CO 1-Hour Standard (ppm):	20.0

8-Hour CO Analysis:

1. Convert annual project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm CO = ($\mu g/m^3$) (0.0245/CO MW)

Where:

CO 8-Hour $\mu g/m^3$:	N/A
CO MW:	28.0
Conversion:	0.0245

So:

ppm CO=	N/A

2. Add CO 8-Hour background ambient data to projects modeling impacts.

ppm CO = (projects modeling impacts + background ambient data)

Where:

Projects modeling impacts (ppm):	N/A	
Ambient background data (ppm):	5.8	Station 4144 - Rubidoux - 1997

So:

Project + Background (ppm):	N/A
Most Stringent CO 8-Hour Standard (ppm):	9.0

Air Quality Impact Analysis - Emission Parameters
GE Gas Turbines - Fumigation Conditions
Riverside ERC

Equipment Information:

Equipment Type: Gas Turbines	Capacity: -	Fuel: Natural Gas
Manufacturer: GE	Output (MW): 100	HHV: 1050
Model: LM6000	# of Units: 2	

Emission Rates:

Pollutant	Per Unit Emission Rate (lbs/hr)	Total Emission Rate (lbs/hr)	Total Emission Rate (g/s)		Comments
NO_x	44.93	89.86	11.32	1-Hour	Commissioning Period (100% Load, Uncontrolled)
NO_x	-	-	-	Annual	
CO	45.93	91.86	11.57	1-Hour	Commissioning Period (100% Load, Uncontrolled)
CO	-	-	-	8-Hour	
PM_{10}	-	-	-	24-Hour	
PM_{10}	-	-	-	Annual	
$PM_{2.5}$	-	-	-	24-Hour	
$PM_{2.5}$	-	-	-	Annual	
SO_x	1.62	3.24	0.41	1 hour / 3-Hour	Commissioning Period (100% Load, Uncontrolled)
SO_x	-	-	-	24-Hour	

From: Joe Loyer [Jmloyer@energy.state.ca.us]
Sent: Tuesday, February 03, 2004 2:44 PM
To: klany@airexperts.com
Cc: Keith Golden; Matthew Layton; Mike Ringer; Roger Johnson
Subject: RE: City of Riverside, 6-mile zip code list

Mr. Lany,

Please find attached the response from SCAQMD regarding potential new emission sources within the zip codes provided for the City of Riverside project. It is a relatively short list that indicates that there are no new emissions expected within these zip codes. The list contains emission sources that petitioned the SCAQMD for modification to existing permits to operate (there were no new PTO petitioned for). The petitions include minor changes and "like in kind" equipment changes which result in no new emissions.

I have equally surveyed the available EIRs on the SCAQMD web site and found that none of the EIRs where in the vicinity of the Riverside area.

Therefore, having followed all due diligence in pursuing all available information on new or modifications to existing emission sources, I am reasonable confident that there are no additional emission sources for cumulative modeling purposes within the project vicinity (6 mile radius).

Sincerely,
Joseph M. Loyer
Associate Mechanical Engineer
California Energy Commission

Fac ID	SIC Code	Name	Address	City	State	Zip	Appl Nbr	Application Date
119940	2952	BUILDING MATERIALS MANUFACTURING CORP	11800 INDUSTRY AVE	FONTANA	CA	92337-6936	368002	4/11/00
119940	2952	BUILDING MATERIALS MANUFACTURING CORP	11800 INDUSTRY AVE	FONTANA	CA	92337-6936	368088	4/11/00
119940	2952	BUILDING MATERIALS MANUFACTURING CORP	11800 INDUSTRY AVE	FONTANA	CA	92337-6936	370855	6/14/00
119940	2952	BUILDING MATERIALS MANUFACTURING CORP	11800 INDUSTRY AVE	FONTANA	CA	92337-6936	371813	6/30/00
119940	2952	BUILDING MATERIALS MANUFACTURING CORP	11800 INDUSTRY AVE	FONTANA	CA	92337-6936	385410	4/18/01
119940	2952	BUILDING MATERIALS MANUFACTURING CORP	11800 INDUSTRY AVE	FONTANA	CA	92337-6936	410287	1/7/03
119940	2952	BUILDING MATERIALS MANUFACTURING CORP	11800 INDUSTRY AVE	FONTANA	CA	92337-6936	410290	1/7/03
119940	2952	BUILDING MATERIALS MANUFACTURING CORP	11800 INDUSTRY AVE	FONTANA	CA	92337-6936	410849	1/14/03
55176	3411	METAL CONTAINER CORP	7155 CENTRAL AVE	RIVERSIDE	CA	92504-1432	415574	5/15/03
135173	4953	RIVERSIDE COUNTY WASTE MANAGEMENT DEPT	1420 HIGHGROVE PASS RD	RIVERSIDE	CA	92507	416360	6/5/03
136972	2821	URETHANE POLYMER INTERNATIONAL INC	10880 POPLAR AVE	FONTANA	CA	92337-7336	416892	6/24/03
136972	2821	URETHANE POLYMER INTERNATIONAL INC	10880 POPLAR AVE	FONTANA	CA	92337-7336	416893	6/27/03
136972	2821	URETHANE POLYMER INTERNATIONAL INC	10880 POPLAR AVE	FONTANA	CA	92337-7336	416894	6/24/03
136972	2821	URETHANE POLYMER INTERNATIONAL INC	10880 POPLAR AVE	FONTANA	CA	92337-7336	416895	6/27/03
136972	2821	URETHANE POLYMER INTERNATIONAL INC	10880 POPLAR AVE	FONTANA	CA	92337-7336	416896	6/24/03
136972	2821	URETHANE POLYMER INTERNATIONAL INC	10880 POPLAR AVE	FONTANA	CA	92337-7336	416899	6/24/03
123739	9999	UNITED OIL	170 HIDDEN VALLEY PKY	NORCO	CA	92860	420845	10/9/03
17749	9223	ST CALIF DEPT CORRECTIONS,CAL REHAB CNTR	5TH & WESTERN ST	NORCO	CA	92860	421072	10/21/03
17749	9223	ST CALIF DEPT CORRECTIONS,CAL REHAB CNTR	5TH & WESTERN ST	NORCO	CA	92860	421073	10/21/03
17749	9223	ST CALIF DEPT CORRECTIONS,CAL REHAB CNTR	5TH & WESTERN ST	NORCO	CA	92860	421074	10/21/03
17749	9223	ST CALIF DEPT CORRECTIONS,CAL REHAB CNTR	5TH & WESTERN ST	NORCO	CA	92860	421075	10/21/03
17749	9223	ST CALIF DEPT CORRECTIONS,CAL REHAB CNTR	5TH & WESTERN ST	NORCO	CA	92860	421076	10/21/03
17749	9223	ST CALIF DEPT CORRECTIONS,CAL REHAB CNTR	5TH & WESTERN ST	NORCO	CA	92860	421077	10/21/03
17749	9223	ST CALIF DEPT CORRECTIONS,CAL REHAB CNTR	5TH & WESTERN ST	NORCO	CA	92860	421078	10/21/03
17749	9223	ST CALIF DEPT CORRECTIONS,CAL REHAB CNTR	5TH & WESTERN ST	NORCO	CA	92860	421079	10/21/03
138310	3479	LUSTER-COTE INC	10841 BUSINESS DR	FONTANA	CA	92337	421394	10/28/03
103618	5142	SPECIALTY BRANDS INC	3038 PLEASANT ST	RIVERSIDE	CA	92507-5554	421482	10/30/03
103618	5142	SPECIALTY BRANDS INC	3038 PLEASANT ST	RIVERSIDE	CA	92507-5554	421483	10/29/03
138402	3271	ORCO BLOCK CO INC	35100 DILLON RD	RIVERSIDE	CA	92509	421600	11/5/03
138402	3271	ORCO BLOCK CO INC	35100 DILLON RD	RIVERSIDE	CA	92509	421601	11/5/03
138402	3271	ORCO BLOCK CO INC	35100 DILLON RD	RIVERSIDE	CA	92509	421602	11/5/03
138402	3271	ORCO BLOCK CO INC	35100 DILLON RD	RIVERSIDE	CA	92509	421603	11/5/03
138402	3271	ORCO BLOCK CO INC	35100 DILLON RD	RIVERSIDE	CA	92509	421604	11/5/03
138690		EXXONMOBIL OIL CORPORATION	11800 MAGNOLIA AVE	RIVERSIDE	CA	92503-4916	422451	12/3/03
103618	5142	SPECIALTY BRANDS INC	3038 PLEASANT ST	RIVERSIDE	CA	92507-5554	423034	12/17/03
103618	5142	SPECIALTY BRANDS INC	3038 PLEASANT ST	RIVERSIDE	CA	92507-5554	423035	12/17/03
138916	5541	MAIN STREET UNOCAL, SAEED SADVANDI DBA	2278 MAIN ST	RIVERSIDE	CA	92501-2219	423269	12/23/03
69982	1442	CALMAT COMPANY	1709 SHERBORN ST	CORONA	CA	92879	423537	12/31/03
69982	1442	CALMAT COMPANY	1709 SHERBORN ST	CORONA	CA	92879	423538	12/31/03
69982	1442	CALMAT COMPANY	1709 SHERBORN ST	CORONA	CA	92879	423539	12/31/03
69982	1442	CALMAT COMPANY	1709 SHERBORN ST	CORONA	CA	92879	423541	12/31/03
69982	1442	CALMAT COMPANY	1709 SHERBORN ST	CORONA	CA	92879	423542	12/31/03
69982	1442	CALMAT COMPANY	1709 SHERBORN ST	CORONA	CA	92879	423544	12/31/03
69982	1442	CALMAT COMPANY	1709 SHERBORN ST	CORONA	CA	92879	423545	12/31/03
69982	1442	CALMAT COMPANY	1709 SHERBORN ST	CORONA	CA	92879	423546	12/31/03
69982	1442	CALMAT COMPANY	1709 SHERBORN ST	CORONA	CA	92879	423547	12/31/03
69982	1442	CALMAT COMPANY	1709 SHERBORN ST	CORONA	CA	92879	423548	12/31/03
69982	1442	CALMAT COMPANY	1709 SHERBORN ST	CORONA	CA	92879	423549	12/31/03
69982	1442	CALMAT COMPANY	1709 SHERBORN ST	CORONA	CA	92879	423551	12/31/03
69982	1442	CALMAT COMPANY	1709 SHERBORN ST	CORONA	CA	92879	423552	12/31/03
69982	1442	CALMAT COMPANY	1709 SHERBORN ST	CORONA	CA	92879	423553	12/31/03

Fac ID	SIC Code	Name	Address	City	State	Zip	Appl Nbr	Application Date
69982	1442	CALMAT COMPANY	1709 SHERBORN ST	CORONA	CA	92879	423554	12/31/03
139005	2813	PLATINUM PROPANE	AGUA MANSA INDUSTRIAL CTR	RIVERSIDE	CA	92509	423631	12/23/03
139005	2813	PLATINUM PROPANE	AGUA MANSA INDUSTRIAL CTR	RIVERSIDE	CA	92509	423632	12/23/03
139005	2813	PLATINUM PROPANE	AGUA MANSA INDUSTRIAL CTR	RIVERSIDE	CA	92509	423633	12/23/03
139005	2813	PLATINUM PROPANE	AGUA MANSA INDUSTRIAL CTR	RIVERSIDE	CA	92509	423634	12/23/03
139005	2813	PLATINUM PROPANE	AGUA MANSA INDUSTRIAL CTR	RIVERSIDE	CA	92509	423635	12/23/03
139005	2813	PLATINUM PROPANE	AGUA MANSA INDUSTRIAL CTR	RIVERSIDE	CA	92509	423636	12/23/03
139005	2813	PLATINUM PROPANE	AGUA MANSA INDUSTRIAL CTR	RIVERSIDE	CA	92509	423637	12/23/03
139005	2813	PLATINUM PROPANE	AGUA MANSA INDUSTRIAL CTR	RIVERSIDE	CA	92509	423638	12/23/03
139005	2813	PLATINUM PROPANE	AGUA MANSA INDUSTRIAL CTR	RIVERSIDE	CA	92509	423639	12/23/03
138916	5541	MAIN STREET UNOCAL, SAEED SADVANDI DBA	2278 MAIN ST	RIVERSIDE	CA	92501-2219	423898	12/24/03
139237		JACK IN THE BOX INC 5349/QUICK STUFF7749	1315 MAGNOLIA AVE	CORONA	CA	92879	424255	1/20/04